

What is claimed is:

1. A method for improving video quality delivered to a display device, comprising:  
encoding a current video signal segment to be decoded at the display device;  
estimating, as part of said encoding step, a time required for decoding said video signal segment at the display device; and  
if the estimated time exceeds a predetermined decoder time period, performing one of:
  - (a) re-encoding said current video signal segment such that it can be decoded within said decoder time period,
  - (b) encoding a subsequent video signal segment to enable decoding thereof without reference to said current segment.
2. The method of claim 1, wherein only step (a) is performed.
3. The method of claim 1, wherein only step (b) is performed.
4. The method of claim 1, wherein said estimating step models a decoder for said display device.
5. The method of claim 4, wherein said model uses components of said decoder that are also present in an encoder used for said current video signal segment encoding step.
6. The method of claim 5, wherein said estimating step uses existing motion estimation information obtained during said encoding step.
7. The method of claim 4, wherein said model estimates a number of memory accesses required to decode said current video signal segment.

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8. The method of claim 4, wherein said model estimates a complexity of said current video signal segment.
9. The method of claim 4, wherein said model determines a number of compressed bits required by said current video signal segment.
10. The method of claim 4, wherein:
  - said encoding step performs block transform coding; and
  - said model monitors a number of blocks skipped during the block transform coding of said video signal segment.
11. The method of claim 4, wherein:
  - said encoding step performs block transform coding;
  - the block transform coding provides different types of blocks; and
  - said model monitors the number of different types of blocks provided during the block transform coding of said video signal segment.
12. The method of claim 1 wherein said display device is a synchronous display device.
13. The method of claim 1 wherein said video signal segment is part of a streaming video data stream.
14. A storage medium encoded with machine-readable computer program code for performing the method of claim 1.

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15. Apparatus for improving video quality delivered to a display device, comprising:  
an encoder for encoding a current video signal segment to be decoded at the display device;

said encoder being adapted to estimate a time required for decoding said video signal segment at the display device, and if the estimated time exceeds a predetermined decoder time period, encoding one of:

(a) said current video signal segment such that it can be decoded within said decoder time period,

(b) a subsequent video signal segment to enable decoding thereof without reference to said current segment.

16. Apparatus in accordance with claim 15, wherein said encoder always encodes said current video signal segment such that it can be decoded within said decoder time period.

17. Apparatus in accordance with claim 15, wherein if the estimated time exceeds said predetermined decoder time period, the encoder always encodes a subsequent video signal segment to enable decoding thereof without reference to said current segment.

18. Apparatus in accordance with claim 15, wherein said encoder models a decoder for said display device in order to estimate the decoding time.

19. Apparatus in accordance with claim 18, wherein said model uses components of said decoder that are also present in the encoder.

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20. Apparatus in accordance with claim 19, wherein said estimating step uses existing motion estimation information obtained during said encoding step.
21. Apparatus in accordance with claim 18, wherein said model estimates a number of memory accesses required to decode said current video signal segment.
22. Apparatus in accordance with claim 18, wherein said model estimates a complexity of said current video signal segment.
23. Apparatus in accordance with claim 18, wherein said model determines a number of compressed bits required by said current video signal segment.
24. Apparatus in accordance with claim 18, wherein:  
said encoder performs block transform coding; and  
said model monitors a number of blocks skipped during the block transform coding of said video signal segment.
25. Apparatus in accordance with claim 18, wherein:  
said encoder performs block transform coding;  
the block transform coding provides different types of blocks; and  
said model monitors the number of different types of blocks provided during the block transform coding of said video signal segment.
26. Apparatus in accordance with claim 15 wherein said display device is a synchronous display device.
27. A system for improving the display quality of a video signal, comprising:  
an encoder for encoding a video stream;

a decoder for decoding said video stream for display on a display device; and  
a communication path for communicating the encoded video stream to said  
decoder;

said encoder modeling said decoder to determine whether a time required for  
decoding a current segment of said video stream is likely to exceed a predetermined  
decoder time period allocated to said segment; wherein:

if said time period is likely to be exceeded, said encoder will encode one of:

(a) said current video signal segment such that it can be decoded within said  
decoder time period,

(b) a subsequent video signal segment to enable decoding thereof without  
reference to said current segment.

28. A system in accordance with claim 27 wherein said communication path  
comprises a streaming video server.

29. A system in accordance with claim 27 wherein at least a portion of said encoder is  
contained in a transcoder for said video stream.

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